Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

BCA(2009 to 2010 Batch) (Sem.–2)

MATHEMATICS-I (DISCRETE)

Subject Code : BC-203

Paper ID : [B0207]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.**

SECTION-A

l. Write short notes on :

(a) Define disjoint sets. Give an example.

(b) Write the power set of the set A = {r, s}.

(c) If R and S are two relations on a set A, then show that R ∩ S is also a relation on A.

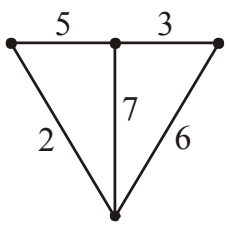
(d) Let H : K → L be a HASH function where L consists of two digit addresses 00, 01, 02, ... 49. Find H (12304) using Division Method.

(e) Define a Regular Graph.

(f) Find the degree of the recurrence relation :

$S^4(K) + 3S^3(K - 1) + 6S^2(K - 2) + 4S(K - 3) = 0.$

(g) Find the minimum spanning tree of the graph shown below the weighted graph.



by weight.

(h) Define chromatic number of a graph G.

(i) Define a directed graph.

(j) Find the truth set of $p(x) = x + 5 < 3$ defined on the set N of positive integers.

SECTION-B

2. A set has three elements and set B has six elements. What can be the maximum number of elements in the set $A \cup B$ if $A \cap B = \phi$.

3. If $\frac{\lfloor n}{\lfloor 2 \ \lfloor n-2}$ and $\frac{\lfloor n}{\lfloor 4 \ \lfloor n-4}$ are in the ratio 2 : 1, find value of n.

4. Prove De Morgan law : $(A \cup B)^C = A^C \cap B^C$.

5. Consider the sets A = {1, 2, 3, 4} and B = {a, b, c}. Let R be a relation from set A to B, where R = {(1, a), (1, b), (2, b), (2, c), (3, b), (4, b)} find the complement $\overline{R}$ of R.

6. Construct the Truth table of :

   $(p \wedge q) \vee (q \wedge R) \vee (r \wedge p)$

7. Let A = {1, 2, 3, 4, 5, 6} and R be an equivalence relation on A defined by R = {(1, 1), (1, 5), (2, 2), (2, 3), (2, 6), (3, 2), (3, 3), (3, 6), (4, 4), (5, 1), (6, 2), (6, 3), (6, 6)}

   Find the equivalence classes of R and the quotient set A / R.